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EXAMINER	
RICE, ELISA M	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/823,055

Applicant(s)

GHOSH, SRINKA

Examiner

ELISA M. RICE

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/86)
Paper No(s)/Mail Date 4/13/2004
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.

... a signal does not fall within one of the four statutory classes of Sec. 101.

... signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Claims 9 and 11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 9, 11 are drawn to functional descriptive material recorded on a computer-readable medium. Normally, the claim would be statutory. However, the specification, at page 5, lines 29-31; page 11, lines 7-12 defines the claimed computer readable medium as ***non-statutory*** subject matter such as a electrical signals over a suitable communication channel, for example, over a private or public network and transferring intercommunicating entity via electronic signals.

"A transitory, propagating signal ... is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (*In re Petrus A.C.M. Nuijten*; Fed Cir, 2006-1371, 9/20/2007).

Because the full scope of the claim as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory. The examiner suggests amending the claim to include the disclosed tangible computer readable media, while at the same time excluding the intangible media such as signals, carrier waves, a suitable communication channel, for example, over a private or public network and transferring intercommunicating entity via electronic signals. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1, 2, 3, 4, 5, 6, 11, 12, 13, 14, 15, 16, 17** are rejected under 35 U.S.C. 102(e) as being anticipated by Shams (US 6,674,882 B1).

Regarding claim 1, Shams discloses a method for rectilinearizing image data from a microarray comprising a double-density, non-rectilinear set of microarray features having a non-rectilinear, outermost, feature position arrangement, the method comprising:

constructing a feature-coordinate system to determine feature positions in the image data (Fig. 3a, numeral 26, “generating a grid 22 in said memory device 14 including a plurality of spaced grid points 24 corresponding to said selected DNA spot images 10”, Shams, column 5, lines 55-67); and based on the determined feature positions, adding

one or more imaginary feature positions to the non-rectilinear, outermost, feature-position arrangement to form a rectilinear, outermost, feature-position arrangement of the microarray features (Fig. 8, numeral 72, "forming a bounding box 52 of size $r \times r$ times around a grid point", Shams, column 10, lines 36-67).

Regarding claim 2, Shams discloses orienting the image of the microarray so that a corner feature is located in the top, left-hand corner of the image of the microarray, and a corner feature is located in the bottom, right-hand corner of the image of the microarray (fig. 7, "adjusting position of said grid point 24 with direction vectors d and e ", Shams, column 10, lines 36-57).

Regarding claim 3, Shams discloses superimposing horizontal and vertical grid lines onto the image so that each feature of the microarray is located at a unique intersection of the horizontal and vertical grid lines (Fig. 7, numeral 24).

Regarding claim 4, Shams discloses selecting three corner-feature positions of microarray features (Fig. 7, numeral 24, Shams, column 7, lines 5-23); and determining four feature positions that provide the four feature corners of a rectilinear, outermost, feature-position arrangement of the image of microarray features based on the three corner-feature positions (Fig. 7, numeral 24, Shams, column 7, lines 5-23). Examiner

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notes that three points need to be determined to select a fourth point to construct a rectangular shape.

Regarding claim 5, Shams discloses selecting the three corner features automatically using a computer program ("automatically selected by the computer", Shams, column 7, lines 51-67).

Regarding claim 6, Shams discloses selecting the three corner features manually ("can be selected by the user", Shams, column 7, lines 51-67).

Regarding claim 11, Shams discloses a computer program including an implementation of the method of claim 1 stored in a computer-readable medium (Fig. 13, numeral 14, "CPU 36 operates on program instructions in the memory 14, Shams, column 13, lines 25-50).

Regarding claim 12, Shams discloses forwarding data produced by using the method of claim 1 (Fig. 8, numeral 80, "displaying the adjusted grid on the display 40", Shams, column 10, lines 36-57).

Regarding claim 13, Shams discloses receiving data produced by using the method of claim 1 (Fig. 8, numeral 80, "displaying the adjusted grid on the display 40", Shams, column 10, lines 36-57). Examiner notes that the display receives the data to display.

Regarding claim 14, Shams discloses a microarray scanner (Fig. 13, numeral 130, "scanner 130 allows scanning micro-arrays and obtaining images frames for processing", column 13, lines 25-50) that employs the method of claim 1 to rectilinearize a set of microarray features having a non-rectilinear, outermost, feature-position arrangement (see rejection of claim 1).

Regarding claim 15, Shams discloses a system for processing a multi-channel, double-density, non-rectilinear set of microarray features data set, the system comprising:

a computer processor (Fig. 13, numeral 36, "central processing unit (CPU)", Shams, column 13, lines 25-50);

one or more memory components that store microarray feature data points (Fig. 13, numeral 122, "storage device 122 for storing information pertaining to micro-array images", column 13, lines 25-50);

and

a stored program executed by the computer processor ("computer system 34 for executing said program instructions a central processing unit (CPU) 36 operates on program instructions in the memory 14)", column 13, lines 25-50) that constructs a feature coordinate system to provide feature positions (Fig. 3a, numeral 26, "generating a grid 22 in said memory device 14 including a plurality of spaced grid points 24 corresponding to said selected DNA spot images 10", Shams, column 5, lines 55-67),

and adds one or more imaginary feature positions to the non-rectilinear, outermost, feature-position arrangement to form a rectilinear, outermost, feature-position arrangement of the microarray features (Fig. 8, numeral 72, "forming a bounding box 52 of size $r \times r$ times around a grid point", Shams, column 10, lines 36-67).

Regarding claim 16, Shams discloses superimposition of horizontal and vertical grid lines onto the image so that each feature of the microarray is located at a unique intersection of the horizontal and vertical grid lines (Fig. 7, numeral 24).

Regarding claim 17, Shams discloses selects three corner-feature positions of microarray features (Fig. 7, numeral 24, Shams, column 7, lines 5-23); and determining four feature positions that provide the four feature corners of a rectilinear, outermost, feature-position arrangement of the image of microarray features based on the three corner-feature positions (Fig. 7, numeral 24, Shams, column 7, lines 5-23). Examiner notes that three points need to be determined to select a fourth point to construct a rectangular shape.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 9, 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shams (US 6,674,882 B1) and in view of Sirohey et al (US 2002/0044696 A1).

Regarding **claim 9**, Shams reference discloses all elements as mentioned above in claim 1. Shams does not disclose transferring results produced by a microarray scanner or microarray data processing program employing the method of claim 1 stored in a computer-readable medium to an intercommunicating entity.

Sirohey, in the same field of endeavor, teaches transferring results produced by a microarray scanner or microarray data processing program employing the method of claim 1 stored in a computer-readable medium to an intercommunicating entity ("one or more file servers designed to receive and process image data", Sirohey, paragraph 37).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Shams reference to utilize an intercommunicating entity to transfer results as taught by Sirohey, to increase the accessibility of the data by allowing multiply users to access the data at "a work station" or "output hard copy images via a printer or other peripheral" (Sirohey, paragraph 37).

Regarding **claim 10**, Shams reference discloses all elements as mentioned above in claim 1. Shams does not disclose transferring results produced by a microarray scanner or microarray data processing program employing the method of claim 1 to an intercommunicating entity via electronic signals.

Sirohey, in the same field of endeavor, teaches transferring results produced by a microarray scanner or microarray data processing program employing the method of claim 1 to an intercommunicating entity via electronic signals ("one or more file servers designed to receive and process image data", Sirohey, paragraph 37).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Shams reference to utilize an intercommunicating entity to transfer results as taught by Sirohey, to increase the accessibility of the data by allowing multiply users to access the data at "a work station" or "output hard copy images via a printer or other peripheral" (Sirohey, paragraph 37).

6. **Claims 7, 8, 18, 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shams (US 6,674,882 B1) and in view of Koppe et al (US 5,671,297).

Regarding **claims 7 and 8**, Shams reference discloses all elements as mentioned above in claim 4.

Shams further discloses partitioning the microarray having a non-rectilinear, outermost, feature position arrangement into a first lattice having a rectilinear, outermost, feature position arrangement and a second lattice having rectilinear, outermost, feature position arrangement (Fig. 7, Shams, column 9, lines 10-46); and determining one or more feature positions defining the rectilinear outermost, feature-position arrangement of the microarray of features (Fig. 7, Shams, column 9, lines 10-46). Examiner notes that a lattice interpreted as any structure and in this reference as a segment of the image (numeral 18). Shams does not disclose determining whether a selected corner-feature position is a corner-feature position in the first lattice or a corner-feature position in the second lattice for each of the three selected corner-feature positions; and determination of whether each of the three selected corner-feature positions belong to the first lattice or the second lattice.

Koppe, in the same field of endeavor, teaches determining whether a selected corner-feature position is a corner-feature position in the first lattice or a corner-feature position in the second lattice for each of the three selected corner-feature positions and determination of whether each of the three selected corner-feature positions belong to the first lattice or the second lattice ("position of the corner point is determined", Koppe, column 2, lines 24-34).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Shams reference to utilize determining corner-feature position in

regards to the lattice as taught by Koppe, to "improve image quality of the output image" due to degradation of the image quality during transformation or alteration of the image from one state to another (Koppe, column 1, lines 55-67, column 2, lines 1-34).

Regarding **claims 18 and 19**, Shams reference discloses all elements as mentioned above in claim 15.

Shams further discloses partitions the microarray having a non-rectilinear, outermost, feature-position arrangement into a first lattice having a rectilinear, outermost, feature-position arrangement and a second lattice having rectilinear, outermost, feature-position arrangement (Fig. 7, Shams, column 9, lines 10-46); and determination of the one or more feature positions defining the rectilinear, outermost, feature-position arrangement of the microarray of features (Fig. 7, Shams, column 9, lines 10-46). Examiner notes that a lattice interpreted as any structure and in this reference as a segment of the image (numeral 18). Shams does not disclose determining whether a selected corner-feature position is a corner-feature position in the first lattice or a corner-feature position in the second lattice for each of the three selected corner-feature positions and whether each of the three selected corner-feature positions belongs to the first lattice or the second lattice.

Koppe, in the same field of endeavor, teaches determining whether a selected corner-feature position is a corner-feature position in the first lattice or a corner-feature position

in the second lattice for each of the three selected corner-feature positions and whether each of the three selected corner-feature positions belongs to the first lattice or the second lattice ("position of the corner point is determined", Koppe, column 2, lines 24-34).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Shams reference to utilize determining corner-feature position in regards to the lattice as taught by Koppe, to "improve image quality of the output image" due to degradation of the image quality during transformation or alteration of the image from one state to another (Koppe, column 1, lines 55-67, column 2, lines 1-34).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELISA M. RICE whose telephone number is (571)270-1582. The examiner can normally be reached on 8:00a.m.-5:30p.m. EST Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on (571)272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elisa M Rice/
Examiner, Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner, Art Unit 2624